

GEPHE SUMMARY

opsin - (SWS1) (<a +opsin+(sws1)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Gene+Gephebase=">https://www.gephebase.org/search-criteria?/and+Gene Gephebase=^opsin - (SWS1)^#gephebase-summary-title)	Gephebase Gene	GP00001704	GepheID
Published	Entry Status	Courtier	Main curator

PHENOTYPIC CHANGE

Physiology (<a +physiology+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait+Category=">https://www.gephebase.org/search-criteria?/and+Trait Category=^Physiology^#gephebase-summary-title)	Trait Category		
Color vision (violet-shift) (<a +color+vision+(violet-shift)+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Trait=">https://www.gephebase.org/search-criteria?/and+Trait=^Color vision (violet-shift)^#gephebase-summary-title)	Trait		
Other fishes	Trait State in Taxon A		
Lambda-max = 423 nm ; violet sensitive scabbard fish	Trait State in Taxon B		
Taxon A	Ancestral State		
Intergeneric or Higher (<a +intergeneric+or+higher+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxonomic+Status=">https://www.gephebase.org/search-criteria?/and+Taxonomic Status=^Intergeneric or Higher^#gephebase-summary-title)	Taxonomic Status		
	Taxon A	Taxon B	
Actinopterygii (<a +actinopterygii+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Actinopterygii^#gephebase-summary-title)	Latin Name	Lepidopus fitchi (<a +lepidopus+fitchi+"#gephebase-summary-title"="" href="https://www.gephebase.org/search-criteria?/and+Taxon+and+Synonyms=">https://www.gephebase.org/search-criteria?/and+Taxon and Synonyms=^Lepidopus fitchi^#gephebase-summary-title)	Latin Name
ray-finned fishes	Common Name	-	Common Name
Actinopterygii; ray-finned fishes; fish; fishes	Synonyms	Lepidopus fitchi Rosenblatt & Wilson, 1987	Synonyms
superclass	Rank	species	Rank
cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi	Lineage	cellular organisms; Eukaryota; Opisthokonta; Metazoa; Eumetazoa; Bilateria; Deuterostomia; Chordata; Craniata; Vertebrata; Gnathostomata; Teleostomi; Euteleostomi; Actinopterygii; Actinopteri; Neopterygii; Teleostei; Osteoglossocephalai; Clupecocephala; Euteleosteoromorpha; Neoteleostei; Eurypterygia; Ctenosquamata; Acanthomorpha; Euacanthomorpha; Percomorphaceae; Pelagiaria; Scombriformes; Trichiuridae; Lepidopodinae; Lepidopus	Lineage
Euteleostomi (bony vertebrates) - (Rank: no rank) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=117571)	Parent	Lepidopus () - (Rank: genus) (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=107244)	Parent
7898 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=7898)	NCBI Taxonomy ID	515182 (https://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?id=515182)	NCBI Taxonomy ID
No	is Taxon A an Infraspecies?	No	is Taxon B an Infraspecies?

GENOTYPIC CHANGE

OPN1SW	Generic Gene Name	P03999 (http://www.uniprot.org/uniprot/P03999)	UniProtKB Homo sapiens
BGP; BOP; CBT	Synonyms	0	GenebankID or UniProtKB
9606.ENSP00000249389 (http://string-db.org/newstring.cgi/show_network_section.pl?identifier=9606.ENSP00000249389)	String		
Belongs to the G-protein coupled receptor 1 family. Opsin subfamily.	Sequence Similarities		
GO:0038023 : signaling receptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0038023)	GO - Molecular Function		
GO:0008020 : G protein-coupled photoreceptor activity (https://www.ebi.ac.uk/QuickGO/term/GO:0008020)			

GO - Biological Process

- GO:0007165 : signal transduction (<https://www.ebi.ac.uk/QuickGO/term/GO:0007165>)
- GO:0007186 : G protein-coupled receptor signaling pathway (<https://www.ebi.ac.uk/QuickGO/term/GO:0007186>)
- GO:0001523 : retinoid metabolic process (<https://www.ebi.ac.uk/QuickGO/term/GO:0001523>)
- GO:0018298 : protein-chromophore linkage (<https://www.ebi.ac.uk/QuickGO/term/GO:0018298>)
- GO:0007601 : visual perception (<https://www.ebi.ac.uk/QuickGO/term/GO:0007601>)
- GO:0071482 : cellular response to light stimulus (<https://www.ebi.ac.uk/QuickGO/term/GO:0071482>)
- GO:0007602 : phototransduction (<https://www.ebi.ac.uk/QuickGO/term/GO:0007602>)

GO - Cellular Component

- GO:0005887 : integral component of plasma membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0005887>)
- GO:0001750 : photoreceptor outer segment (<https://www.ebi.ac.uk/QuickGO/term/GO:0001750>)
- GO:0097381 : photoreceptor disc membrane (<https://www.ebi.ac.uk/QuickGO/term/GO:0097381>)

<p>No (https://www.gephebase.org/search-criteria?/and+Presumptive Null=^No^#gephebase-summary-title)</p> <p>Coding (https://www.gephebase.org/search-criteria?/and+Molecular Type=^Coding^#gephebase-summary-title)</p> <p>Deletion (https://www.gephebase.org/search-criteria?/and+Aberration Type=^Deletion^#gephebase-summary-title)</p> <p>1-9 bp</p> <p>deletion of Phe86 (3-bp deletion)</p> <p>Candidate Gene (https://www.gephebase.org/search-criteria?/and+Experimental Evidence=^Candidate Gene^#gephebase-summary-title)</p> <p>Evolutionary replacement of UV vision by violet vision in fish. (2009) (https://pubmed.ncbi.nlm.nih.gov/19805066)</p> <p>Tada T; Altun A; Yokoyama S</p> <p>The vertebrate ancestor possessed ultraviolet (UV) vision and many species have retained it during evolution. Many other species switched to violet vision and, then again, some avian species switched back to UV vision. These UV and violet vision are mediated by short wavelength-sensitive (SWS1) pigments that absorb light maximally (λ_{max}) at approximately 360 and 390-440 nm, respectively. It is not well understood why and how these functional changes have occurred. Here, we cloned the pigment of scabbardfish (<i>Lepidopus fitchi</i>) with a λ_{max} of 423 nm, an example of violet-sensitive SWS1 pigment in fish. Mutagenesis experiments and quantum mechanical/molecular mechanical (QM/MM) computations show that the violet-sensitivity was achieved by the deletion of Phe-86 that converted the unprotonated Schiff base-linked 11-cis-retinal to a protonated form. The finding of a violet-sensitive SWS1 pigment in scabbardfish suggests that many other fish also have orthologous violet pigments. The isolation and comparison of such violet and UV pigments in fish living in different ecological habitats will open an unprecedented opportunity to elucidate not only the molecular basis of phenotypic adaptations, but also the genetics of UV and violet vision.</p>	<p>Presumptive Null</p> <p>Molecular Type</p> <p>Aberration Type</p> <p>Deletion Size</p> <p>Molecular Details of the Mutation</p> <p>Experimental Evidence</p> <p>Main Reference</p> <p>Authors</p> <p>Abstract</p> <p>Additional References</p>
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RELATED GEPHE

<p>9 (Green-sensitive opsin (RH2), Rhodopsin (RH1), opsin - rhodopsin (LWS), opsin - (SWS2), opsin - (SWS2B), Rx1, opsin - rhodopsin1 (RH1), opsin - rhodopsin1-A (RH1-A), opsin - rhodopsin1-B (RH1-B)) (https://www.gephebase.org/search-criteria?/or+Taxon ID=^7898^/and+Trait=Color vision/or+Taxon ID=^515182^/and+Trait=Color vision/and+groupHaplotypes=true#gephebase-summary-title)</p> <p>No matches found.</p>	<p>Related Genes</p> <p>Related Haplotypes</p>
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EXTERNAL LINKS

COMMENTS